ARDEC
BATTLEFIELD MAINTENANCE ENGINEERING DIVISION
DESCRIPTION FOR PURCHASE
DFP-375, Rev J
05 NOV 2003

TRESTLES, MOTOR VEHICLE MAINTENANCE AND STORAGE
5 & 7 TON RATING
(VEHICLE SUPPORT STANDS)

1 Scope. This Description for Purchase describes the performance and design characteristics of vehicle support stands of the rack and pawl type that are positioned under raised motor vehicles to support the vehicles at pre-determined heights for maintenance or storage.

1.1 Classification. Trestles (jack stands) covered by this document are:

5 US Tons load capacity, NSN 3950-00-262-0392
7 US Tons load capacity, NSN 3950-00-251-8013

The terms “trestle”, “vehicle support stand” and “jack stand” are used interchangeably in the industry and in this description.

2 APPLICABLE DOCUMENTS

2.1 Commercial standards. The following document forms a part of this description for purchase to the extent specified herein.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS

ASME/ANSI PALD-1997 and addendum 2000a – Section 4, Vehicle Support Stands

(Application for copies should be addressed to the American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017. The ASME maintains a web site at www.asme.org.)

3 REQUIREMENTS

3.1 Configuration. The required configuration utilizes the rack and pawl type lock (for height adjustment) with a rectangular base, similar to that depicted in ASME PALD section 4, figure 4.1.

3.2 Design. The trestles shall conform to the requirements of TABLE I. The trestles shall be new and designed for positioning under raised motor vehicles and shall be capable of supporting the specified load at various heights. The trestles shall meet all of the requirements of ASME/ANSI PALD-1997 and addendum 2000a, Section 4 and all of the additional requirements of this Description for Purchase.

TABLE I
TRESTLE DIMENSIONS

Load Capacity	Maximum allowable height of saddle when fully lowered	Required saddle height when fully extended, not less than
5 tons	16 inches	24 inches
7 tons	21 inches	30 inches

3.2.1 Materials. Materials used in the trestle shall be suitable for the intended purpose in the design of the trestle and shall be free from defects that would adversely affect the performance of the assembly. When dissimilar metals are used in contact with each other, suitable protection against galvanic corrosion shall be applied.

3.2.2 Reclaimed materials. The manufacturer may use reclaimed materials for fabricating new parts. Reclaimed materials shall be reprocessed, remanufactured, or recycled in a manner that restores them to the same chemical composition and physical properties as the materials originally selected for use in their new condition. Use of reclaimed parts as is or rebuilt from scrap or other used equipment will not be permitted and product made from such materials will not be accepted.

3.2.3 Castings and forgings. Castings and forgings shall be free of defects which affect serviceability or performance, i.e. fins, scale, inclusions, cold shuts, voids, cracks, thermal ruptures, laps, folds, mismatching, etc. Defective castings and forgings shall not be reclaimed for use on this end item.

3.2.4. Fastening devices. Fastening devices and methods shall be chosen to serve the need while providing necessary adjustability for service, maintenance or repair. Fasteners shall be installed to prevent loss of tightness and shall not loosen in service.

3.2.5 Welding. Welding shall be neat in appearance and shall be strong enough to withstand application of the proof load and off-center rated loads to the completed trestle without cracking, or other damage.

3.2.6 Painting. All surfaces of the trestles, inside and out, shall be painted in accordance

with the best practice of the commercial jack and vehicle support stand industry. Dried paint shall not interfere with the free movement of the pawl.

3.2.7 Workmanship. The quality of workmanship imparted to the trestles presented for acceptance shall assure that they have been manufactured with skill and care; shall be uniform, neat, and clean; and shall be free of irregularities and anomalies that degrade form, fit, function, performance or appearance.

3.2.8 Identification marking. Trestles shall be permanently marked with the National Stock Number, contract number, manufacturer's name, nomenclature and load capacity. In addition, the rated capacity in tons shall be cast or stamped into both the trestle column and base in characters no less than .5 inches high.

3.2.9 Caution plate. A caution plate, stating no less than the following, shall be permanently affixed to the trestle on the same side as the handle.

CAUTION
DO NOT OVERLOAD STANDS.
PLACE LOAD ON CENTER OF SADDLE ONLY.
USE STANDS IN PAIRS, ON HARD LEVEL SURFACE.
LOAD AND STANDS SHALL BE STABLE.
STUDY, UNDERSTAND, AND FOLLOW ALL INSTRUCTIONS.
FAILURE TO HEED THIS WARNING MAY RESULT
IN PERSONAL INJURY AND/OR PROPERTY DAMAGE.

3.3 Product performance characteristics. The trestles shall remain fully functional throughout their anticipated use life. The trestles shall be capable of supporting the proof load and off-center rated load in all height positions from fully lowered to fully extended with no failure or permanent deformation exceeding 0.125 inches in the trestle base length and width or saddle height.

3.3.1 Off-center load. The trestles shall not become unstable when subjected to the rated load capacity on one lip of the saddle and then on the other lip at any and all positions from fully lowered to fully extended. The trestles shall evidence no sign of column bending, visible cracks, component failure or permanent deformation measured at the top of the lug exceeding .125 inches after being loaded on each lip of the saddle.

3.3.2 Proof load. The proof load shall be 1.5 times the rated load capacity. With the proof load applied on both lips of the saddle, the trestle shall sustain the proof load at any and all positions from fully lowered to fully extended, with no permanent deformation exceeding 0.125 inches, no cracked welds, no mechanical failure, and no component damage.

3.3.3 Adjustability. The height of the saddle shall be easily and readily adjusted by hand and shall remain so after all load bearing requirements have been demonstrated.

3.4 Component parts. The trestles shall consist of a base, a one piece column and saddle with rack, a pawl, a handle and any other components needed to effect an adequate design for the intended purpose.

3.4.1 Base. The trestle base shall have four legs forming a pyramid configuration that is symmetrical about the column. The trestles shall be supported from the bottoms of the legs only. No pads or supporting plates shall be used on the bottom of the legs. The base shall afford a sturdy structure for the distribution of the supported load and shall meet the requirements of PALD paragraph 4-2.6 which addresses stability. The upper portion of the base, called the collar, shall position and retain the column and saddle and shall not deform under proof load or off-center loading.

3.4.2 Column and saddle. The column and saddle shall support the load and transfer the force through the collar to the trestle base. The saddle is the load contacting and bearing part of the column and shall provide safe retention of frame members, under carriage, lower control arms, cross members, spring mountings and shackles, axle and axle housings, etc. of vehicles. The saddle height shall be adjustable in increments of not more than 1.5 inches from the fully lowered position to the fully extended position. Retention lips at the ends of the saddle shall be at least .25 inch high on the inside dimension. The column and saddle shall be integrated as a single piece casting or forging and shall have the rack machined, cast, or forged into the column. The rack shall meet the requirements of 3.4.3. The trestle shall be designed such that the bottom end of the column shall not come closer than 0.25 inch to a flat surface under the trestle when the trestle is subjected to the proof load with the column in the lowest possible position. The design of the trestle shall prevent separation of the column and saddle from the base when the trestle is lifted by the column or saddle.

3.4.3 Rack and pawl. The configuration of the rack and pawl shall be such that the pawl engages the rack at every tooth by action of gravity alone as the rack is raised past the pawl. The pawl shall be integral with the handle and shall utilize the weight of the handle to engage the pawl with the teeth of the rack. The trestle shall contain no springs or other devices to cause the pawl to engage the rack, or to augment the force imparted by gravity. Deliberate action by the operator shall be required for rack and pawl disengagement. In addition, the teeth of the rack shall be designed to interlock with the pawl as a load is applied from above, so that the pawl cannot be disengaged from the rack without removing the load and raising the saddle slightly.

3.4.4 Handle. A handle shall be provided to accommodate one-handed lifting and carrying of the trestle.

3.5 Manuals. The owners/operators manuals shall include the safety information

specified in ASME/ANSI PALD-1997, Section 4-3.1 and 4-3.2.

4 PRODUCT CONFORMANCE VERIFICATION

4.1 Responsibility for verification. The supplier shall perform all examinations and verifications required to assure conformance of the offered and delivered product with the requirements specified herein. Except as otherwise specified in the contract, the supplier may use his own or any other facilities suitable for the performance of the examination and verification procedures specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the examinations or verifications set forth in this document where such examinations or verifications are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for conformance. All trestles must meet all requirements of the contract. The examination and verification processes set forth in this Description for Purchase shall become part of the contractor's overall quality program. The absence of an examination or verification requirement in the Description for Purchase shall not relieve the contractor of the responsibility of assuring that all trestles and associated manuals submitted to the government for acceptance comply with all requirements of the contract. Sampling procedures to verify quality of production runs is encouraged and recommended. However, sampling for quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the government to the acceptance of defective material.

4.2 Product conformance verification. Product conformance verification shall be performed to provide clear evidence that the trestles offered for delivery under this contract are designed and manufactured to perform as required. Product conformance verification shall be performed at the beginning of the contract on four trestles fully representative of the production units, assembled, painted and marked as required. Each of the four units shall be subjected to the full set of examinations and verifications as specified herein. The product conformance verification requirements specified herein are classified as follows:

a. Product examination (see 4.3)
b. Performance verification (see 4.4)
c. Packaging inspection (see 4.5)

If more than one size of trestle is being procured then each size shall be represented by four units.

4.2.1 Failure to verify conformance. Failure to provide complete and adequate evidence of product conformance at the beginning of the contract shall be construed as evidence that the products tested and all products, which they represent, are not in conformance with the requirements of this contract. As a result of failure to verify product conformance the

Government may seek remedy under the termination clause of the contract.

4.3 Product examination. Visually, dimensionally, and manually examine each trestle to determine conformance with the requirements of 3.2 thru 3.2.9 and 3.4 thru 3.4.4. Visual examinations shall include verification of completeness of manufacture and assembly, conformance to specified standards, adequacy of markings, proper cleaning, and freedom from identified defects. Dimensional examination includes measuring dimensions, as specified. Manual examinations shall include the operation of movable parts by hand to assure proper functioning. During production the examinations may be performed at the earliest practical point in manufacture at which it is feasible to inspect for acceptance without risk of change to the characteristic examined by subsequent operations. Failure of the contractor to provide objective evidence that the trestles have passed the examinations prescribed for them by the contractor's inspection system shall be cause for rejection.

4.4 Performance verification. The baseline measurement and verification procedures of 4.4.3, 4.4.4 and 4.4.5 shall be performed in the order given, and in accordance with the requirement of 4.4.1 and 4.4.2.

4.4.1 Compression testing machine. The verification procedures specified in 4.4.4 and 4.4.5 shall be conducted using a compression testing machine which is accurate within five percent of the load being measured. (Accuracy to the maximum load capability of the machine is not an acceptable substitute.) The accuracy of the testing machine, including the effects of off-center (eccentric) loading, shall be verified in accordance with ASTM E4. Dead loads are considered unsafe for verification purposes and should not be used. All loads shall be applied through platens of such sufficient thickness and hardness that they will not deform or coin under the loads applied to the trestle. The platens shall be flat and smooth and shall not restrain the trestle from tipping, moving, or deforming during load testing.

4.4.2 Measurements. All measurements shall be taken while the trestle is resting on a surface, which is flat and smooth within 0.001 inch. If suitable, the lower platen of the testing machine may be used for this purpose. The measuring device used shall be accurate within 0.0005 inch. The trestle shall be visually examined for cracked welds and other damage. Following the off center loading the distance from the surface plate or lower platen to the top of each lip of the saddle shall be measured with the saddle and column fully raised. Following the proof load the distance from the surface plate or lower platen to the flat top of the saddle shall be measured with the saddle and column fully raised and the length and width of the base shall be measured. Measurements taken shall be logical to the loading that was applied. The off center loading is applied to the lugs, measure the lug height at each lug. The length and width of the base is affected by each loading but is to be measured after the proof load test to indicate the accumulative affects of the off center loading and the proof loading combined.

4.4.3 Baseline measurements. Prior to the performance verification procedures, the

trestle shall be examined and baseline measurements shall be taken in accordance with 4.4.2. The baseline measurement shall be recorded only once for each trestle. The baseline shall be used for comparison with similar measurements taken after the verification procedures of 4.4.4 and 4.4.5 to determine the extent of permanent deformation of the trestle, if any. Evidence of cracked welds, permanent deformation exceeding the allowed limits or other damage noted either before or after any of the verification procedures shall be cause for rejection.

4.4.4 Off-center loading verification. The following verification procedure shall be performed on each end, in turn, of the trestle saddle. Note that PALD 4-4.1.1 specifies that measurements to determine deformation of the trestle shall be taken after loading only one lug. Then the other lug shall be loaded and measured. This prevents a condition wherein the trestle may have deformed beyond acceptable limits on the first loading and then have been deformed back into acceptable limits after the second loading. The trestle is never allowed to deform out of acceptable limits regardless of subsequent effects of further loading. The trestle shall be positioned in the load test machine with the saddle and column fully extended. A load equal to the trestle's specified capacity shall be applied to one end of the saddle for not less than 10 minutes. The load shall then be removed and the trestle examined for damage and for permanent deformation in accordance with 4.4.2. The second end shall then be loaded and measured as the first was. Following the examination and measurements, the operability of the rack and pawl mechanism shall be verified. Evidence of cracked welds or other damage; permanent deformation in excess of the limits specified; failure of the rack and pawl mechanism to operate freely throughout it's entire adjustment range; or any tipping, overturning, or movement of the trestle shall be cause for rejection (see 3.3.1). The off-center loading test is recommended to be applied during the production sampling for quality verification.

4.4.5 Proof load verification. The trestle shall be positioned in the load testing machine with the saddle and column fully extended. A proof load equal to 1.5 times the trestle's specified capacity shall be applied to the saddle for not less than 10 minutes. The proof load shall then be removed and the trestle examined for damage and measured for permanent deformation in accordance with 4.4.2. Following the examination and measurement, the operability of the rack and pawl mechanism shall be checked. Evidence of cracked welds or other damage; permanent deformation in excess of the limits specified; or failure of the rack and pawl mechanism to operate freely throughout it's entire adjustment range shall be cause for rejection (see 3.3.2). Trestles that have been subjected to proof load verification, either in the product performance verification phase or in the production quality assurance sampling phase, shall not be shipped to the Government in fulfillment of contract quantity requirements. Such trestles shall be considered as "used equipment' and the loss of their value shall be considered part of the cost of product quality assurance. The trestles shall be considered to have been tested until consumed even though they may have passed the test without failure.

4.4.6 Functional verification. After the completed trestle has been painted and the paint has dried, the trestle shall be operated to verify that the rack and pawl mechanism are free to

perform as necessary under the influence of gravity. The verification shall consist of raising and lowering the saddle by hand, allowing the pawl to engage each tooth of the rack in turn. At each increment of saddle height adjustment, an attempt shall be made to dislodge the pawl by pushing on, shaking, and turning the saddle. When the saddle is fully extended, the trestle shall be lifted by the saddle. Failure of the pawl to automatically engage each tooth of the rack as the saddle is lifted; ability to dislodge the pawl from the rack through any movement of the saddle other than straight up; separation of the column and saddle from the base when the trestle is lifted by the saddle; or inability to lower the raised saddle shall be cause for rejection (see 3.4.2 and 3.4.3).

4.5 Packaging examination. Visually examine a completed sample of packaging to determine conformance with the packing requirements. Visual examinations shall include verification of completeness of paint coverage on the trestles, proper application of markings and labels, conformance to specified packaging standards and specifications, verification of proper stacking of trestles on pallet, completeness of pallet assembly, proper markings on the exterior of the pallet (see 5.5.1), and proper size of the pallet. The examination provisions may be applied at the earliest practical point in manufacture before acceptance and shipping.

5.0 Packaging Requirements Sheet Commercial DS6417.

5.1 The preservation, packing, and marking requirements for the item identified above shall be accomplished in accordance with the performance requirements defined herein. The following Packaging requirements shall apply:

5.1.1 PRESERVATION: COMMERCIAL

5.1.2 LEVEL OF PACKING: Commercial

5.1.3 QUANTITY PER UNIT PACKAGE: 1 PAIR

5.1.4 Packaging. Preservation, packaging, packing, unitization and marking furnished by the supplier shall provide protection for a minimum of one year, provide for multiple handling, redistribution and shipment by any mode and meet or exceed the following requirements.

5.1.5 Cleanliness. Items shall be free of dirt and other contaminants which would contribute to the deterioration of the item or which would require cleaning by the customer prior to use. Coatings and preservatives applied to the item for protection are not considered contaminants.

5.1.6 Preservation. Items susceptible to corrosion or deterioration shall be provided protection by means of preservative coatings, volatile corrosion inhibitors, desiccants, waterproof and/or water/ vapor proof barriers.

5.1.7 Cushioning. Items requiring protection from physical and mechanical damage (e.g. fragile, sensitive, material critical) or which could cause physical damage to other items, shall be protected by wrapping, cushioning, pack compartmentalization, or other means to mitigate shock and vibration to prevent damage during handing and shipment.

5.2 Unit Package. A unit package shall be so designed and constructed that it will contain the contents with no damage to the item(s), and with minimal damage to the unit pack during shipment and storage in the shipping container, and will allow subsequent handling. The outermost component of a unit package shall be a container such as a sealed bag, carton or box.

5.2.1 Unit Package Quantity. Unless otherwise specified, the unit package quantity shall be one each part, set, assembly, kit, etc.

5.2.2 Intermediate Package. Intermediate packaging is required whenever one or more of the following conditions exists:

a. the quantity is over one (1) gross of the same national stock number,
b. use enhances handling and inventorying,
c. the exterior surfaces of the unit pack is a bag of any type, regardless of size,
d. the unit pack is less than 64 cubic inches,
e. the weight of the unit pack is under five (5) pounds and no dimension is over twelve (12) inches.

Intermediate containers shall be limited to a maximum of 100 unit packs, a net load of 40 pounds, or a maximum volume of 1.5 cubic feet, whichever occurs first.

5.3 Packing.

5.3.1 Unit packages and intermediate packages not meeting the requirements for a shipping container shall be packed in shipping containers. All shipping containers shall be the most cost effective and shall be of minimum cube to contain and protect the items.

5.3.2 Shipping Containers. The shipping container (including any necessary blocking, bracing, cushioning, or waterproofing) shall comply with the regulations of the carrier used and shall provide safe delivery to the destination at the lowest tariff cost. The shipping container shall be capable of multiple handling, stacking at least ten feet high, and storage under favorable conditions (such as enclosed facilities) for a minimum of one year.

5.4 Unitization. Shipments of identical items going to the same destination shall be palletized if they have a total cubic displacement of 50 cubic feet or more unless skids or other forklift handling features are included on the containers. Pallet loads must be stable, and to the greatest extent possible, provide a level top for ease of stacking. A palletized load shall be of a

size to allow for placement of two loads high and wide in a conveyance. The weight capacity of the pallet must be adequate for the load. The preferred commercial expendable pallet is a 40 x 48 inch, 4-way entry pallet although variations may be permitted as dictated by the characteristics of the items being unitized. The load shall be contained in a manner that will permit safe handling during shipment and storage.

5.5 Marking.

5.5.1 All unit packages, intermediate packs, exterior shipping containers, and, as applicable, unitized loads shall be marked in accordance with MIL-STD-129, Revision P, Date15 Dec 02 including bar coding. The contractor is responsible for application of special markings as discussed in the Military Standard regardless of whether specified in the contract or not. Special markings include, but are not limited to, Shelf-life markings, structural markings, and transportation special handling markings. The marking of pilferable and sensitive materiel will not identify the nature of the materiel.

5.5.2 Contractors and vendors shall apply address markings using a bar coded military shipment label (MSL) for all shipments except contractor to contractor. The MSL will include both linear and 2D bar codes per the standard. The DD Form 250 or the commercial packing list shall have bar coding applied as per Direct Vendor Delivery Shipments in the standard (except for deliveries to DLA Distribution Depots, e.g. New Cumberland, San Joaquin, Red River, Anniston).

5.5.3 Contractor to contractor shipments shall have the address markings applied to the identification marked side of the exterior shipping container or to the unitized load markings. The following shall be marked "FROM: name and address of consignor and TO: name and address of consignee".

5.5.4 Military Shipping Label. The Army has developed software to create Military Shipment Labels. It's called Computer Automated Transportation Tool Military Shipment Label/Issue Receipt Release Document (CATT MSL/IRRD) and is available to anyone with a contract with the government. The software can be downloaded from the following website main page: http://www.asset-trak.com/catt/catt.htm. Or go directly to the software download page http://www.asset-trak.com/catt/msl_irrd/msl_irrddownload.htm. Be sure to bookmark this page for future releases of CATT MSL/IRRD.

5.5.5 Hazardous Materials. In addition to the general instructions listed above, hazardous materials or items as defined in CFR Title 49 are also subject to all applicable Department of Transportation regulations for packaging/packing, marking, labeling, container certification, and transport as listed in Code of Federal Regulations Title 49, Parts 100-180. If the shipment originates from outside the continental United States, the shipment shall be prepared in accordance with the United Nations Recommendations on the Transport of

Dangerous Goods in a manner acceptable to the Competent Authority of the nation of origin and in accordance with regulations of all applicable carriers.

5.5.6 Heat Treatment and Marking of Wood Packaging Materials. All non-manufactured wood used in packaging shall be heat treated to a core temperature of 56 degrees Celsius for a minimum of 30 minutes. The box/pallet manufacturer and the manufacturer of wood used as inner packaging shall be affiliated with an inspection agency accredited by the board of review of the American Lumber Standard Committee. The box/pallet manufacturer and the manufacturer of wood used as inner packaging shall ensure tractability to the original source of heat treatment. Each box/pallet shall be marked to show the conformance to the International Plant Protection Convention Standard. Boxes/pallets and any wood used as inner packaging made of non-manufactured wood shall be heat-treated. The quality mark shall be placed on both ends of the outer packaging, between the end cleats or end battens; on two sides of the pallet. . Foreign manufacturers shall have the heat treatment of non-manufactured wood products verified in accordance with their National Plant Protection Organization's compliance program.

5.6 Quality Assurance. The contractor is responsible for establishing a quality system. Full consideration to examinations, inspections, and tests will be given to ensure the acceptability of the commercial package.

5.7 Supplemental instructions. None